Biodiversity Data Journal 13: e156613
doi: 10.3897/BDJ.13.e156613

open access

Taxonomy & Inventories

A new species of the genus *Afissa* Dieke, 1947 (Coleoptera, Coccinellidae) from China

Lezhi Wang‡, Qifan Yang§, Quan Zhang§, Xingmin Wang§

‡ Beijing No. 8 High School, Beijing, China
§ College of Plant Protection, South China Agricultural University, Guangdong, China

Corresponding author: Xingmin Wang (wangxmcn@scau.edu.cn)

Academic editor: Enrico Ruzzier

Received: 22 Apr 2025 | Accepted: 16 May 2025 | Published: 30 May 2025

Citation: Wang L, Yang Q, Zhang Q, Wang X (2025) A new species of the genus *Afissa* Dieke, 1947 (Coleoptera, Coccinellidae) from China. Biodiversity Data Journal 13: e156613. https://doi.org/10.3897/BDJ.13.e156613

ZooBank: urn:lsid:zoobank.org:pub:CC958311-980A-46CA-AEDE-872F25EF7E03

Abstract

Background

Recent morphological and molecular studies have clarified some aspects of the taxonomy of *Afissa* Dieke, 1947, but many species remain unexamined or misclassified. Additional taxonomic work is essential to resolve the classification and distribution of *Afissa* species in Asia, particularly in China.

New information

Afissa xuexii **sp. nov.** is described from Yunan and Guizhou Province, China. This new species is characteried by its typical bifurcated penis guide. Diagnosis, description and illustrations are provided.

Keywords

Ladybird, *Epilachnini*, new species, China, taxonomy

© Wang L et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

The genus *Afissa* Dieke, 1947 (Coleoptera, Coccinellidae, *Epilachnini*) was established by Dieke (1947) to include the Eurasian species of *Epilachna* Chevrolat, 1837, which are characteriszed by the undivided sixth female segment and toothless claws, with *Coccinella flavicollis* Thunberg, 1781 [=*Afissa flavicollis* (Thunberg, 1781)] designated as the type species. Li and Cook (1961), after examining the type species of *Epilachna* (*E. borealis* (Fabricius, 1775)) and *Afissa* (*A. flavicollis* (Thunberg, 1781)), noted that both type species shared the aforementioned characters and exhibit similar typical male genital structures; accordingly, Li and Cook (1961) reduced *Afissa* to synonymy with *Epilachna*. Szawaryn et al. (2015), based on molecular phylogenetic evidence, restored some *Asian* species of *Epilachna* to *Afissa* and synonymised the genus *Afissula* Kapur, 1985 with *Afissa*. Tomaszewska and Szawaryn (2016) further revised the tribe *Epilachnini* Mulsant, 1846, based on morphological characters and transferred several species from *Afissa* (*A. chapini* Dieke, 1947; *A. complicata* Dieke, 1947; *A. convexa* Dieke, 1947; *A. magna* Dieke, 1947; *A. militaris* Dieke, 1947; *A. quadricollis* Dieke, 1947; *A. subacuta* Dieke, 1947; *A. szechuana* Dieke, 1947) to the genus *Uniparodentata* Wang & Cao, 1993. In addition, several species from *Epilachna* (*E. parvula* Crotch, 1874; *E. sanscrita* Crotch, 1874; *E. plicata* Weise, 1889; *E. flavimarginalis* Hoàng, 1978; *E. ampliata* Pang & Mao, 1979; *E. max* Pang & Ślipiński, 2012) were transferred to *Afissa* and the diagnostic characters of *Afissa* were re-described.

Tomaszewska and Szawaryn (2016) proposed that most *Asian* species, formerly classified within *Epilachna*, likely belong to *Afissa*. In recent years, some *Epilachna* species have been re-assigned to *Afissa*, further supporting this view (Szawaryn 2018, Das et al. 2020, Das et al. 2023, Iqbal et al. 2024). The taxonomy of *Afissa* remains unresolved and further studies on this genus will help to clarify the confusion between *Afissa* and *Epilachna*.

In this study, we report a new species of *Afissa* from Yunnan and Guizhou Provinces, China and provide a description and illustration herein.

Materials and methods

The specimens examined in this study were collected from Yunnan and Guizhou Provinces, China. All examined specimens are deposited in the Department of Entomology, South China Agricultural University (SCAU), Guangzhou, China.

The classification system follows Szawaryn et al. (2015). Adult morphological terminology used in this paper follows Ślipiński and Tomaszewska (2010). External structures were examined under a dissecting stereoscope (SteREO Discovery V20, Zeiss). The following measurements were recorded using a micrometer:

- **TL** total length, from apical margin of clypeus to apex of elytra;
- **TW** total width, across both elytra at widest part;

- **TH** total height, through the highest point of elytra to metaventrite;
- **HW** head width, including eyes;
- **PL** pronotal length, from the middle of the anterior margin to the base of the pronotum;
- **PW** pronotal width at widest part;
- **EL** elytral length, along the suture, from the apex to the base including the scutellum;
- **EW** elytral width, synonymous with TW.

Photographs of the habitus of specimens were taken with a digital camera (EOS 5D Mark IV, Canon), mounted on a focus stacking rail (WeMacro Rail), with Helicon Remote v. 3.9.12 utilised for image capture. The dissected male genitalia were cleaned in a 10% sodium hydroxide (NaOH) solution and transferred to neutral balsam for preservation. Genitalia were imaged using a digital camera (Axiocam 506 colour), connected to a microscope (Zeiss Imager M2), with ZEN 2.3 utilised for image capture. Helicon Focus v. 8.1.1 was used for image stacking. All images were further processed in Adobe Photoshop 2019.

Taxon treatments

Afissa Dieke, 1947

Nomenclature

Afissa Dieke, 1947: 113. Type species (original designation): *Coccinella flavicollis* Thunberg, 1781. Type locality: East Indies. Synonymised with *Epilachna* Chevrolat in Dejean, 1837, by Li and Cook (1961). Resurrected from synonymy by Szawaryn et al. (2015).

Afissula Kapur, 1958. Type species (original designation): *Afissula rana* (Kapur 1958). Mentioned in Jadwiszczak and Węgrzynowicz (2003); Kovár 2007; Ren et al. (2009). Synonymised by Szawaryn et al. (2015).

Epilachna Chevrolat in Dejean, 1837 (in part). Synonymised by Tomaszewska and Szawaryn (2016).

Diagnosis

Afissa can be reliably distinguished from all other *Asian* representatives and the remaining genera of *Epilachnini* by a unique combination of morphological characters: antenna longer than head width; coxites much longer than wide; mandibular incisor edge without teeth; lateral margins of elytra most often not or hardly visible from above (sometimes visible from above, but narrow); metanepisternum with simple, smooth inner margin; mid- and hind coxae with smooth hind margin.

Afissa xuexii Wang & Wang, sp. nov.

- ZooBank 0F7F9FCD-CF91-4D18-B839-422222D7F9DF

Materials

Holotype:

a. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Pingbian County; locality: Mount Dawei; verbatimElevation: 2100 m; samplingProtocol: Sweep netting; eventDate: 11-19/10/2006; individualCount: 1; sex: male; lifeStage: adult; recordedBy: Wang Xing-Min; collectionCode: Insects; occurrenceID: BE19C187-EF54-5DE9-85FF-ECA3C9DE85A7

Paratypes:

a. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Pingbian County; locality: Mount Dawei; verbatimElevation: 2100 m; samplingProtocol: Sweep netting; eventDate: 11-19/10/2006; individualCount: 16; sex: male; lifeStage: adult; recordedBy: Wang Xing-Min; collectionCode: Insects; occurrenceID: 5C9D6F4A-E372-5F39-B149-40C59A6964C9

b. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Pingbian County; locality: Mount Dawei; verbatimElevation: 2100 m; samplingProtocol: Sweep netting; eventDate: 11-19/10/2006; individualCount: 10; sex: female; lifeStage: adult; recordedBy: Wang Xing-Min; collectionCode: Insects; occurrenceID: D77F8963-02CC-5456-B00F-5CC443AF6780

c. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Pingbian County; locality: Mount Dajian; verbatimElevation: 2100 m; samplingProtocol: Sweep netting; eventDate: 20-21/04/2008; individualCount: 11; sex: male; lifeStage: adult; recordedBy: Ren S.X., Wang X.M., Chen X.S. & Hao J.Y.; collectionCode: Insects; occurrenceID: FE0D6A3E-53DB-52B1-A17E-06AA8970F09E

d. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Pingbian County; locality: Mount Dajian; verbatimElevation: 2100 m; samplingProtocol: Sweep netting; eventDate: 20-21/04/2008; individualCount: 12; sex: female; lifeStage: adult; recordedBy: Ren S.X., Wang X.M., Chen X.S. & Hao J.Y.; collectionCode: Insects; occurrenceID: 4280CF0F-B3B1-5101-A688-6FA9BC4770BB

e. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Cangyuan County; locality: Banhong Village, Nangun River; verbatimElevation: 1790 m; samplingProtocol: Sweep netting; eventDate: 14-15/05/2008; individualCount: 8; sex: male; lifeStage: adult; recordedBy: Wang X.M., Liang H.B., Hao J.Y. & Peng W.L.; collectionCode: Insects; occurrenceID: CE5122B9-D425-528C-8B5B-D488EE9FBF35

f. scientificName: *Afissa xuexii*; country: China; stateProvince: Yunnan; county: Cangyuan County; locality: Banhong Village, Nangun River; verbatimElevation: 1790 m; samplingProtocol: Sweep netting; eventDate: 14-15/05/2008; individualCount: 4; sex: female; lifeStage: adult; recordedBy: Wang X.M., Liang H.B., Hao J.Y. & Peng W.L.; collectionCode: Insects; occurrenceID: C5DA2DC2-44B0-5F3C-B6DE-CF123DC7BA77

g. scientificName: *Afissa xuexii*; country: China; stateProvince: Guizhou; county: Zunyi City; locality: Xishui National Nature Reserve; verbatimElevation: 1016 m; verbatimCoordinates: 28°30′52″N, 106°28′18″E; decimalLatitude: 28.5144; decimalLongitude: 106.4717; samplingProtocol: Sweep netting; eventDate: 18-22/07/2022; individualCount: 3; sex: female; lifeStage: adult; recordedBy: Wang Xing-Min; collectionCode: Insects; occurrenceID: 4E1A4A11-67B8-5AD3-8816-804D84516C47

Description

TL: 4.7-4.9 mm, TW: 3.5-3.8 mm, TH: 2-2.2 mm, TL/TW: 1.29-1.34; PL/PW: 2.18-2.2; EL/EW: 1.11-1.14.

Body elongate-oval, moderately convex, with only a narrow outer margin flattened (Figs. 1a-c). Dorsum densely covered with white pubescence. Colour: Head yellow. Pronotum yellow with a large central black spot. Scutellum black. Elytra yellow with black spots. Prosternum yellow, meso- and metasternum black and epipleura yellow. Legs yellow; trochanters and 2/3 of femora blackish-brown.

Head relatively small, approximately 0.34 times the width of the body (Fig. 1d). Frons flat, with fine and dense punctures, inter-puncture distance 0.5–1.5 times their diameter; surface smooth and glossy, bearing short golden setae. Eyes relatively small, prominently projecting, with a rough surface and distinct small facets; interocular distance approximately 0.23 times the head width.

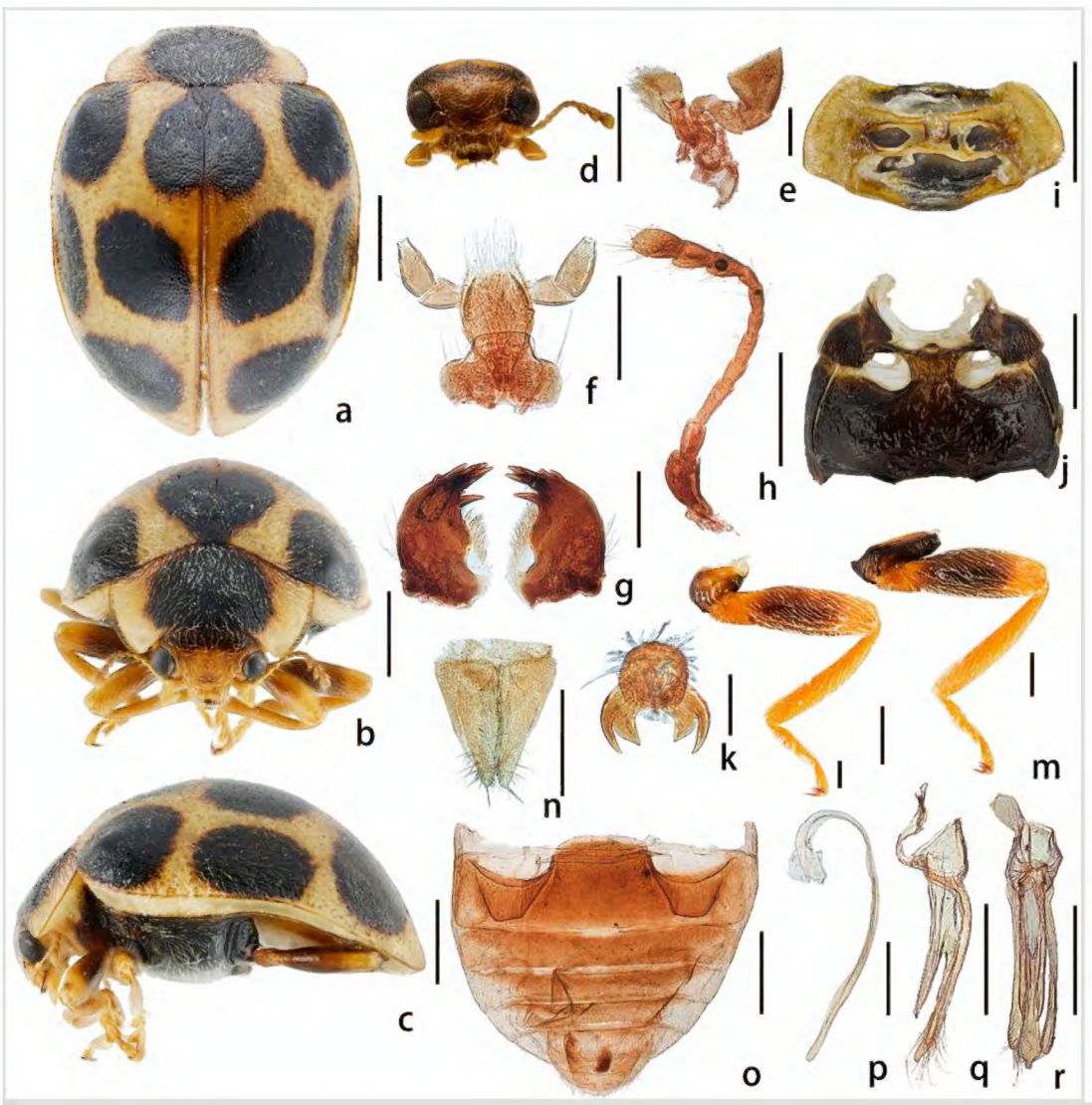

Figure 1. doi

Afissa xuexii sp. nov. **a** dorsal view; **b** frontal view; **c** lateral view; **d** head frontal view; **e** maxilla; **f** labium; **g** left and right mandible; **h** antenna; **i** prothorax; **j** mesoventrite and metaventrite; **k** tarsal claws; **l** mid-leg; **m** hind leg; **n** female genitalia; **o** abdomen; **p** penis; **q** tegmen, lateral view; **r** tegmen, ventral view. Scale bars: a–c, d, h-j, l, m, o-r: 1.0 mm; e-g, k, n: 0.2 mm.

Pronotum transverse, arcuate lateral margins, slightly reflexed (Fig. 1b). Anterior angles not prominent, rounded and blunt; anterior margin arcuate and concave medially. Posterior angles rounded; posterior margin tightly fused to elytral base, width approximately 0.29 times body width (body width/pronotal width = 3.45). Surface with punctures similar in size to those on the head, smooth and glossy, inter-puncture distance 0.5–1.0 times their diameter.

Elytra strongly vaulted, smooth and glossy, densely punctured (Fig. 1a). Punctures small, indistinct and varying in size. Each elytron with five black spots arranged in 2-2-1 pattern. Black spot near scutellum fused at suture.

Prosternum T-shaped, with a quadrate process, lacking prosternal process, surface rough and densely covered with fine setae (Fig. 1i). Mesosternum trapezoidal, with a slight longitudinal elevation at the centre, anterior margin slightly concave medially, surface rough and densely covered with fine setae (Fig. 1j). Metasternum wide, with a distinct median discrimen, longitudinally concave near the median discrimen, with central elevation on both sides; surface finely punctate and densely covered with short fine setae, inter-puncture distance 1.0–2.5 times their diameter. Abdomen with nearly complete abdominal postcoxal lines, posterior margin almost reaching the hind margin of the first abdominal segment (Fig. 1o).

Tarsal claws with two terminal teeth, inner tooth non-opposing, lacking basal tooth (Fig. 1k).

Male genitalia. Penis slender, curved in circular shape, with a short, expanded penis capsule (Fig. 1p). Distal 1/3 of the penis slightly enlarged and rounded at apex. In lateral view (Fig. 1q), distal half of the penis guide splits into two parts, part near the parameres longer. Parameres slender, arcuate, slightly shorter than the penis guide, with sparse setae at apex. In ventral view (Fig. 1r), shorter part of the penis guide noticeably wider than longer part, the latter with a finger-like process at apex.

Female genitalia. Coxites subtriangular, densely setose apically. Inner margins smooth, without depressions. Styli distinct, each bearing an apical seta (Fig. 1n).

Diagnosis

Afissa xuexii closely resembles *A. expansa* (Dieke, 1947), *A. hydrangeae* Pang & Mao, 1979, *A. kambaitana* (Bielawski, 1966) and *A. anhweiana* (Dieke, 1947) in elytral colouration and pattern and their distributions are geographically proximate. However, *A. xuexii* can be easily distinguished from these species by its bifurcate penis guide and the elongate-oval body shape. Bifurcate penis guide is a rare and distinctive diagnostic character within *Afissa*.

Etymology

The new species is named after Xuexi, an institution that provided valuable support and inspiration in the first author's study of insect taxonomy.

Distribution

China (Yunnan, Guizhou).

Discussion

Pang et al. (2012) provided the comprehensive taxonomic study on the genus *Epilachna* in China, recording over 100 species from China. However, following the revision of *Epilachnini* by Szawaryn et al. (2015) and Tomaszewska and Szawaryn (2016), only very few species were correctly transferred to *Afissa*, while the majority remain unexamined. Tomaszewska and Szawaryn (2016) suggested that a considerable number of *Asian* species previously placed in *Epilachna* may actually belong to *Afissa*.

This study represents the only recent contribution describing new species of *Afissa* and the discovery further supports the diagnostic characters shared by *Afissa*. In recent years, several taxonomic revisions have been conducted: Das et al. (2020) revised *A. gibbera* (Crotch, 1874), *A. mystica* (Mulsant, 1850) and *A. undecimspilota* (Hope, 1831); Das et al. (2023) revised *A. langpingensis* (Zeng & Yang, 1996) and *A. sureilica* Kapur, 1961; and Iqbal et al. (2024) revised *A. cuonaensis* (Pang & Mao, 1977), *A. schawalleri* (Canepari, 1997) and *A. similbengalica* (Canepari, 2012). Although some of these species are known from China, none of the recent studies re-examined any Chinese specimens. Therefore, a thorough revision of *Epilachna* species in China is a crucial task in the morphological taxonomy of Chinese Coccinellidae.

Acknowledgements

We are very grateful to Mr. K.Y. Wang (SCAU) for his advice and English reviewing. We also sincerely appreciate the institution Xuexi (Beijing, China) for providing the first author with opportunity to study in insect taxonomy.

References

- Das P, Chandra K, Gupta D (2020) The ladybird beetles (Coleoptera: Coccinellidae) of Arunachal Pradesh, East Himalaya, India with new combinations and new country records. Zoological Research Museum Alexander Koenig 69 (1): 27-44. https://doi.org/10.20363/bzb-2020.69.1.027
- Das P, Banerjee D, Gupta D (2023) New records and new combinations of ladybird beetles from India (Coleoptera: Coccinellidae). Records of the Zoological Survey of India 123 (i2S): 77-84. https://doi.org/10.26515/rzsi/v123/i2s/2023/172502
- Dieke GH (1947) Ladybeetles of the genus *Epilachna* (sens, lat.) in Asia, Europe, and Australia. Smithsonian Miscellaneous Collections, Washington 106 (15): 1-183.
- Iqbal Z, Azad R, Nasir MF, et al. (2024) Review of ladybird tribe *Epilachnini* Mulsant, 1846 (Coleoptera: Coccinellidae) from Pakistan. Oriental Insects 59 (1): 54-100. https://doi.org/10.1080/00305316.2024.2374352

- Jadwiszczak A, Węgrzynowicz P (2003) World catalogue of Coccinellidae. Part I-Epilachninae. Mantis, Olsztyn, 264 pp.
- Kapur AP (1958) Coccinellidae of Nepal. Records of the Indian Museum 53 (1955): 309-338. https://doi.org/10.26515/rzsi/v53/i3-4/1955/162012
- Kovár I (2007) Family Coccinellidae Latreille, 1807, pp. 568–631. In: Lobl I, Smetana A (Eds) Catalogue of Palaearctic Coleoptera, Vol. 4. Apollo Books, Stenstrup, 935 pp.
- Li CS, Cook EF (1961) The Epilachninae of Taiwan (Col.: Coccinellidae). Pacific Insects, Honolulu 3 (1): 31-91.
- Pang H, Ślipiński A, Wu Y, Zuo Y (2012) Contribution to the knowledge of Chinese *Epilachna* Chevrolat with descriptions of new species (Coleoptera: Coccinellidae: Epilachnini). Zootaxa 3420: 1-37. https://doi.org/10.11646/zootaxa.3420.1.1
- Ren SX, Wang XM, Pang H, et al. (2009) Colored pictorial handbook of ladybird beetles in China. Science Press, Bejing, 336 pp.
- Ślipiński A, Tomaszewska W (2010) Coccinellidae Latreille, 1802. In: Leschen RA, Beutel RG, Lawrence JF (Eds) Handbook of Zoology, Vol. 2, Coleoptera. Walter de Gruyter GmbH & Co. KG, Berlin/New York, 454-472 pp.
- Szawaryn K, Bocak L, Ślipiński A, et al. (2015) Phylogeny and evolution of phytophagous ladybird beetles (Coleoptera: Coccinellidae: Epilachnini), with recognition of new genera. Systematic Entomology 40 (3): 547-569. https://doi.org/10.1111/syen.12121
- Szawaryn K (2018) Taxonomic notes on Australian herbivorous ladybird beetles (Coccinellidae: Epilachnini). Zootaxa 4413 (1): 158-162. https://doi.org/10.11646/zootaxa.4413.1.5
- Tomaszewska W, Szawaryn K (2016) Epilachnini (Coleoptera: Coccinellidae)—A revision of the world genera. Journal of Insect Science 16 (1): 1-91. https://doi.org/10.1093/jisesa/iew082